Pending Claims

1. (Withdrawn) A method for developing a photorefractive treatment of a patient's eye, comprising:

obtaining a diagnostic measurement of the patient's eye;

using the diagnostic measurement to determine at least one of a lower-order and a higher-order aberration of the eye; and

developing a photorefractive treatment by adjusting a prospective photorefractive treatment for the at least one aberration based upon at least one of a biodynamically and a biomechanically induced deviation from an expected result of the prospective treatment in the absence of the biodynamically or biomechanically induced deviation to compensate for said deviation.

2. (Withdrawn) The method of claim 1, wherein said adjustment is an empirical adjustment.

3. (Withdrawn) The method of claim 1, wherein said diagnostic measurement includes at least one of a wavefront aberration measurement, a topography measurement, an OCT measurement, an ultrasound measurement, and a pachymetry measurement.

4. (Withdrawn) The method of claim 1, wherein the photorefractive treatment comprises an ablation pattern that is the sum of ablation patterns for each of a contributing aberration order.

5. (Withdrawn) The method of claim 1, wherein said treatment is a multi-stage treatment.

6. (Withdrawn) The method of claim 1, wherein said treatment is adapted to provide a sum total of rotationally symmetric aberrations that is equal to or greater than a sum total of rotationally asymmetric aberrations.

7. (Withdrawn) The method of claim 1, further comprising obtaining another diagnostic measurement that is indicative of a shape of a stromal surface of the patient's eye.

8. (Withdrawn) The method of claim 1, wherein said diagnostic measurement is made through a line of sight of the patient's eye.

9. (Withdrawn) The method of claim 1, comprising performing a photoablative treatment with a laser beam having a diameter, d, at a target location between $0.5mm < d < 7mm$.

10. (Original) A method for correcting for higher order aberrations of a patient's eye, comprising:

inflicting a required surgical trauma to the eye corresponding to a particular ophthamological procedure;

obtaining diagnostic wavefront information subsequent to inflicting the trauma;

developing a treatment for correcting the higher order aberrations of the patient's eye based at least in part upon the subsequent wavefront information.

11. (Original) The method of claim 10, wherein the surgical trauma includes at least one of a lamellar corneal cut, a keratectomy, a keratotomy, a corneal abrasion, a corneal puncture, a corneal incision.

12. (Original) The method of claim 11, wherein said trauma is a keratome cut to create a LASIK flap and further wherein said diagnostic wavefront information is obtained prior to lifting said flap.

13. (Original) The method of claim 10, wherein developing the treatment comprises considering a biodynamical effect in response to the trauma, further wherein said subsequent wavefront information includes indicia of said biodynamical effect.

14. (Withdrawn) The method of claim 1, further comprising obtaining a diagnostic measurement of the patient's eye prior to inflicting the surgical trauma.

15. (Original) The method of claim 10, further comprising obtaining a diagnostic measurement of the patient's eye prior to inflicting the surgical trauma.

16. (Original) The method of claim 15, further comprising using said prior diagnostic

information and said subsequent wavefront information to develop said treatment.

17. (Original) The method of claim 13, wherein developing the treatment includes determining an ablation profile that is adjusted with respect to a prospective ablation profile associated with correcting the higher order aberrations in the absence of considering the biodynamical effect in response to the trauma.

18. (Original) The method of claim 17, wherein said adjustment is an empirical based adjustment.

19. (Original) The method of claim 10, wherein said subsequent wavefront information is obtained at a time after the infliction of the surgical trauma ranging from substantially immediately to an empirically or diagnostically determined time in consideration of a biodynamic effect of the eye in response to the surgical trauma.

20. (Original) The method of claim 19, wherein said determined time is within one month of said trauma infliction.

21. (Original) The method of claim 10, wherein said obtained wavefront information is at least one of a direct wavefront measurement or derived from a non-direct wavefront measurement.

22. (Original) The method of claim 10, further comprising:

considering a prospective biomechanical effect of the eye with respect to the developed treatment; and

adjusting said developed treatment, at least in part, as a function of the prospective biomechanical effect of the eye.

23. (Original) The method of claim 10, further comprising obtaining a different diagnostic measurement indicative of a characteristic of the epithelium of the eye, and using information from this measurement to adjust the developed treatment to compensate for a biomechanical effect of the eye.

24. (Original) The method of claim 23, wherein said epithelium characteristic includes at least one of an epithelial profile and epithelial thickness.

25. (Original) The method of claim 10, further comprising treating the eye.

26. (Original) The method of claim 25, wherein after said treatment, the sum total of rotationally symmetric aberrations is equal to or greater than a sum total of rotationally asymmetric aberrations.

27. (Original) The method of claim 10, wherein said diagnostic wavefront information is obtained by a measurement made through a line of sight of the patient's eye.

28. (Original) The method of claim 25, comprising performing a photoablative treatment with a laser beam having a diameter, d, at a target location between $0.5\text{mm} \leq d \leq 7\text{mm}$.

29. (Original) The method of claim 25, wherein said treatment includes at least one of photo-ablation and a corneal inlay.

30. (Original) The method of claim 29, comprising performing a photoablative treatment with a laser beam having a diameter, d, at a target location between $0.5\text{mm} \leq d \leq 7\text{mm}$.

31. (Withdrawn) A method for lessening a regression effect from refractive treatment of a patient's eye, comprising:

adjusting a prospective treatment for modifying an optical aberration of the patient's eye in consideration of at least one of a biodynamic effect and a biomechanic effect of the eye.

32. (Withdrawn) The method of claim 31, wherein said biodynamic effect comprises epithelial growth and said biomechanic effect includes eyelid pressure.

33. (Withdrawn) The method of claim 31, wherein at least one of the biodynamic effect and the biomechanic effect comprises a filling-in of a high frequency variation in a treated surface of the patient's eye.

34. (Withdrawn) The method of claim 31, wherein a sum total of rotation ally symmetric aberrations is equal to or greater than a sum total of rotation ally asymmetric aberrations after treatment of the eye.

35. (Withdrawn) An improved system for refractive surgery on a patient's eye, comprising:

a laser system suitable for photo-refractive correction of eye tissue;

a computer linked to the laser system that is used, in part, to develop a photo-refractive treatment;

a laser control system linked to the laser system and the computer;

a viewing system linked to the laser system for visualization of the patient's eye during treatment; and

a platform adapted to provide a surgical position for the patient,

wherein the improvement comprises a diagnostic measurement instrument linked to the system and adapted such that a diagnostic measurement can be made on the patient's eye with the patient remaining in the surgical position.

36. (Withdrawn) The system of claim 35, wherein the diagnostic measurement instrument comprises at least one of a wavefront sensor, a topographic analyzer, a ray tracing device, an ultrasound device, a pachymetric device and an OCT device.

37. (Withdrawn) The system of claim 35, wherein said diagnostic measurement instrument provides at least one of a direct wavefront measurement of the patient's eye and information from which wavefront information is derivable.

38. (Withdrawn) The system of claim 35, wherein said diagnostic measurement instrument is integral with said system.